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- [54] CALCIUM AND TRACE MINERAL SUPPLEMENTS COMPRISING ESTROGEN
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[58] Field of Search 424/630, 639, 641, 682; 514/182, 574

[56] References Cited

U.S. PATENT DOCUMENTS

- 3,949,098 4/1976 Bangert 426/324
3,950,547 4/1976 Lamar, III et al. 426/74
3,992,555 11/1976 Kovacs 426/72
4,070,488 1/1978 Davis 426/72
4,107,346 8/1978 Kronitz 426/648
4,214,996 7/1980 Buddemeyer et al. 252/1
4,351,735 9/1982 Buddemeyer et al. 252/1
4,419,369 12/1983 Nichols et al. 426/2
4,497,800 2/1985 Larson et al. 514/2
4,722,847 2/1988 Heckert 426/74
4,786,510 11/1988 Nakel et al. 424/648
5,128,374 7/1992 Kochanowski 514/574
5,186,965 2/1993 Fox et al. 426/74

FOREIGN PATENT DOCUMENTS

- 2845570 4/1980 Fed. Rep. of Germany .
56-097248 12/1979 Japan .

OTHER PUBLICATIONS

Hughes et al., "Effects of Calcium Carbonate and Hydroxyapatite on Zinc and Iron Retention in Postmenopausal Women, American Journal of Clinical Nutrition", Jul. 1986, pp. 83-88.

S. V. Ting, "Nutrients and Nutrition of Citrus Fruits",

ACS, 1980, Hungerford, et al., "Interactions of pH and Ascorbate in Intestinal Iron Absorption" American Institute of Nutrition, 1983, pp. 2615-2622.
Riis et al., "Does Calcium Supplementation Prevent Postmenopausal Bone Loss?", New England J. of Medicine, 316, pp. 173-177 (1987).
L. Nilas et al., "Calcium Supplementation and Postmenopausal Bone Loss", British Medical Journal, 289, pp. 1103-1106 (1984).
H. Spencer et al., "NIH Concensus Conference: Osteoporosis", Journal of Nutrition, 116, pp. 316-319 (1986).
W. A. Peck, et al., Physician's Resource Manual on Osteoporosis National Osteoporotic Foundation (1987).
Reginster, et al., "Trace Elements and Postmenopausal Osteoporosis: A Preliminary Study of Decreased Serum Manganese", Med. Sci. Res., 16, pp. 337-338 (1988).
Strause, et al. "The Effect of Deficiencies of Manganese and Copper on Osteoinduction and on Resorption of Bone Particles in Rats", Calcif. Tissue Int. 41, pp. 145-150 (1987).

R. C. Haynes, Jr., et al. "Agents Affecting Calcification", Pharmacological Basis of Therapeutics, (1985), 7th Ed. pp. 1517-1543.
G. D. Whedon et al., "An Analysis of Current Concepts and Research Interests in Osteoporosis", Current Advances in Skeletogenesis, (1985), pp. 327-333.

(List continued on next page.)

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[57] ABSTRACT

Nutritional mineral supplements comprising calcium citrate malate and salts of manganese, copper and zinc are disclosed. These supplements, which provide at least 25% RDA of the minerals, are used in addition to the normal diet. These supplements are useful for increasing bone growth and for treating age-related bone loss in humans and animals.

9 Claims, No Drawings